

TABLE OF CONTENTS

	Page
Introduction and notice required under FCC Rule 1.1206	3
The Commission prefers broadly worded rules rather than detailed specifications, so that rapid changes in technology do not make them obsolete.	3
Intelligent boosters are the only ones compatible with blanket licensing, in contrast to license-by-rule, so that they can be marketed with minimal changes in existing FCC rules.	4
The memory card of intelligent boosters constitute complete control and authorization by the carriers.	6
The kill switch of intelligent boosters provides ultimate control over malfunctioning devices by the carriers.	7
Carrier concerns relating to actual use of the kill switch may be addressed via a clearinghouse approach.	8
An example of the kill switch telemetry user interface illustrates its detailed operation.	9
Final rule making by the Commission must happen sooner than later in order to prevent the proliferation of the present generation of boosters that cause crippling interference.	10
Conclusions	10
Attachment 1 – Sample User Interface for Technician’s Kill Switch Terminal	12
Attachment 2 – Illustrated Summary of the Smart Booster	13
FCC 2.803 Compliance Notice	16

Introduction and notice required under FCC Rule 1.1206

On October 7, 2011 Michael Millard, Jeremy K. Raines, Ph.D., P.E., and Frank Lee of Smart Booster met with Roger Noel, Joyce Jones, Moslem Sawez, Becky Schwartz, Thomas Derenge and Jennifer Johnston, all from the Wireless Telecommunications Bureau. The above listed parties discussed the ongoing proceeding regarding the use of signal boosters for wireless services, with particular attention to the matters disclosed below.

Pursuant to Section 1.1206 of the Commission's Rules, this Notice of Ex Parte Communication is being filed electronically via ECFS.

1. The Commission prefers broadly worded rules rather than detailed specifications, so that rapid changes in technology do not make them obsolete.

Advances in technology or an improved understanding of existing technology will likely make detailed engineering specifications either non-applicable or counterproductive.

A good example is the output power of a signal booster intended for individual consumers. The power should be sufficient to provide reliable wireless communication in rural locations and other areas of marginal coverage, but not so great as to cause interference in urban areas. Much has been written in the Comments and Reply Comments about what that power ought to be; however, there is serious disagreement about an exact value.

In contrast, there is little or no disagreement about the desirability of a booster that is sufficiently intelligent to know where to turn itself off and where to turn itself on. The exact nature or implementation of that intelligence need not be rigidly specified in FCC rules, only that the booster possess it.

2. Intelligent boosters are the only ones compatible with blanket licensing, in contrast to license-by-rule, so that they can be marketed with minimal changes in existing FCC rules.

Consistent with the desirability of broad based rules as discussed in the previous section is the desirability for the minimum amount of new rule making necessary to deliver the intended results. Those results are reliable wireless communication at rural and underserved locations and the elimination of interference from boosters to wireless networks. To that end, the Commission and Smart Booster discussed what new rules might actually be required to bring intelligent boosters into the market place.

Intelligent boosters require almost no new rule making for at least two reasons. First, they are channelized in contrast to being broadband. Second, by virtue of their memories, they know which channels are in use by a particular carrier at a particular location. So, there is no danger of boosting a signal from a carrier that does not want its signal boosted.

In contrast, according to the NPRM, all other boosters will require a new License-by-Rule approach because they are broadband. Without license-by-rule, no single carrier could unilaterally approve a broadband booster because it would also amplify the signals from handsets licensed to other carriers.

In the opinion of Smart Booster, the only significant rule change required by intelligent boosters concerns Rule 22.923 which prohibits the insertion of an electronic device in the uplink between a handset and a base station. Obviously, that rule needs to be modified to permit the insertion of any signal booster.

The broad based rules suggested by Smart Booster in its Comments are:

1. Amend rule 22.923 to permit boosters to be inserted between handsets and base stations, and update certain of its definitions.

2. Require all boosters to have a minimum amount of intelligence so that they know where to amplify, when to amplify, how much to amplify, and within which spectrum blocks to amplify.
3. Require that all intelligent boosters have a provision to guarantee that their intelligence remains current.
4. Decertify all boosters that do not meet the above minimum requirements.
5. Require networks to support intelligent boosters by providing databases appropriately encoded on a compatible memory card in a timely manner.

Table 1 shows how the carriers and Smart Booster agree on the desirability of blanket licensing over license-by-rule.

[Remainder of page intentionally blank.]

<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; text-align: center;"> Devices Must be Operable Under Existing Carrier Blanket Licensing </div> <div style="font-size: 2em; font-weight: bold;">↔ ? ↔</div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> Devices Require New FCC Part-95 License-byRule </div> </div>		
CARRIERS:		
ATT	✓	
BLOOSTON LICENSEES	✓	
CINCINNATI BELL	✓	
CTIA	✓	
SPRINT	✓	
TIA	✓	
T-MOBILE	✓	
US CELLULAR	✓	
VERIZON	✓	
WCAI	✓	
BOOSTER MANUFACTURERS:		
CELL ANTENNA CORP.		✗
CELL LYNX		✗
CELLPHONE MATE		✗
POWERFUL SIGNAL		✗
SMART BOOSTER	✓	
WILSON ELECTRONICS		✗
WIRELESS EXTENDERS		✗

Table 1. All of the carriers and Smart Booster favor blanket licensing over license-by-rule. In contrast, broadband unintelligent boosters require license-by-rule.

3. The memory card of intelligent boosters constitute complete control and authorization by the carriers.

There was extensive discussion concerning the many advantages of the memory card that is an essential component of any intelligent booster. First, the memory card may be distributed separately from the booster itself. In that way, initial registration and activation of the booster can be controlled by the carriers. This satisfies the carriers' desire to authorize all boosters under existing blanket licensing rules.

Second, the memory card contains an expiration date after which the intelligent booster will not operate. This protects future versions of the wireless networks, with respect to both changes in configuration and introduction of new signaling technologies.

Smart Booster agreed with the Commission that the expiration date should occur at reasonable calendar intervals so as not to frustrate rules regarding the blanket licensing of carrier controlled devices. Third, the memory card could contain a unique identifier. That information would enable registration, a clearinghouse, or whatever other record keeping might be desired by the carriers or by the Commission.

4. The kill switch of intelligent boosters provides ultimate control over malfunctioning devices by the carriers.

Many carriers have expressed a desire to remotely disable a signal booster in the event it ever causes interference to their networks. In response, Smart Booster proposed a “kill switch” that would enable a carrier, or its authorized agent, to remotely disable a malfunctioning intelligent signal booster. The kill switch uses a low-power, short range telemetry transceiver that was selected deliberately for reasons that shall become clear shortly in this Section 4.

Smart Booster does not believe the use of existing cellular in-band signaling can replace the kill switch functions for at least the following reason. There are simply too many differing technologies within the networks deployed by the various carriers and each would require substantial and unique modification of their signaling standards. Modifying these standards would be a tremendous undertaking. Further, it is ultimately unlikely to produce the desired result because wireless networks can not distinguish booster interference from other sources, such as an oscillating, amplified, rabbit ear type TV antenna, or a paging transmitter’s second harmonic. Indeed, interference from these diverse sources appear nearly identical when viewed on a spectrum analyzer.

If the interference source can not be uniquely identified by the network, then there is obviously no possibility of remotely shutting it down. Furthermore, in-band signaling techniques cannot work if they are subject to the same interference they seek to eliminate.

Carrier concerns relating to actual use of the kill switch may be addressed via a clearinghouse approach.

In these proceedings, several Commenters have suggested that a national clearinghouse be created to administer a signal booster registration database. As envisioned, the clearinghouse would collect information from consumers regarding their signal boosters, carrier affiliation, and intended areas of operation. The information collected by the clearinghouse would then be shared among the carriers.

Smart Booster believes device registration is fully and robustly achieved via the controlled distribution of memory cards by the carriers. However, a clearinghouse could provide many useful services in addition to registration. For example, a clearinghouse effectively secures the transaction between the carrier's field technician and the offending booster, thereby preventing the unauthorized disabling of a particular device.

The clearinghouse could also act as an arbiter in the event a malfunctioning booster operating on one network requires remote disabling by a competing network. This action would effectively satisfy the requests of many Commenters that clearinghouse device registration data be shared for the purpose of timely interference abatement. Finally, a clearinghouse could provide carrier-customized e-mail alerts to subscribers in the event their devices are remotely disabled. These highly automated communications would provide subscribers with instructions to remedy the situation, such as a referral to a qualified repair center.

With regard to subscriber privacy, a clearinghouse could obviate any need to store device ownership information, encrypted or otherwise, within an intelligent booster's memory card.

An example of the kill switch telemetry user interface illustrates its detailed operation.

As proposed by Smart Booster, a carrier or other authorized entity would remotely activate a booster's kill switch through the use of a low-cost, low-power, short range portable telemetry transceiver. For convenience and minimum cost, this transceiver could operate as a peripheral of the technician's existing laptop computer or similar device.

Since both the intelligent booster and the telemetry transceiver are enabled with GPS, it is a simple matter to calculate a booster's physical location in relation to the technician's position. This information is readily displayed for the field technician's use.

Attachment 1 shows one possible screen display of the kill switch telemetry transceiver. The screen is divided into several columns. The far left column identifies all intelligent boosters within range, regardless of carrier affiliation. The middle column provides basic information about the booster, such as its model number, serial number, carrier affiliation, range, bearing, and memory card status. Subscriber contact information may be presented as clear text, or as an identification code used to search the clearinghouse database. The right hand column of the screen provides the booster's status, such as its GPS location data, the ON/OFF state of the booster, and the booster's power output level for any enabled blocks of spectrum programmed into its memory for its present location.

In practice, a technician will examine all intelligent boosters within range for obvious malfunctions. If an obvious malfunction is not readily apparent, then the technician may cycle through each booster and momentarily silence each one while monitoring the network for impairment. If a match is found, then the

technician may permanently disable that device remotely, triggering whatever actions are specified by the carriers.¹

If no match is found, then the technician would look for other sources of interference, which might include legacy, non-intelligent signal boosters.

5. Final rule making by the Commission must happen sooner than later in order to prevent the proliferation of the present generation of boosters that cause crippling interference.

The Commission and Smart Booster agreed that the present regulatory environment, under which boosters cause interference to the wireless networks, cannot continue. Further, without appropriate rule making, the situation will only worsen with the introduction of more unregulated boosters and the increased sensitivity of new network signaling technology. Therefore, the deadline for definitive action will most likely be less than a year away.

Conclusions

Smart Booster and the FCC agree on many issues brought to light by the recent NPRM proceedings. Most notably, we agree that any rule making must be sufficiently broad so that it remains useful after inevitable advances in wireless technology. Precisely specifying many engineering details, such as booster output power, would be counterproductive.

In addition, Smart Booster and the FCC agree that a rule making cannot be delayed indefinitely. It is important to expeditiously halt the proliferation of unintelligent boosters that presently cause widespread interference to wireless networks. It is also critical to provide reliable wireless communication to rural America and to other users in locations of marginal or unusable signal coverage.

¹ Individual carriers may choose to prohibit other carriers from disabling the booster. In this event, the booster will not adjust its operation in response to telemetry requests but will continue to provide its operational information, including any subscriber contact or clearinghouse identification.

There appeared to be a consensus that the memory cards of intelligent boosters provide the control and authorization desired by the wireless carriers. This means that intelligent boosters can be marketed under existing blanket licensing rules with minimal modification of those rules. Furthermore, the memory cards would enable accurate registration and the implementation of a clearinghouse if desired.

A kill switch incorporated into an intelligent booster provides an additional layer of protection against interference from devices that somehow malfunction. An authorized technician using a remote control unit can easily identify and disable such devices without hands-on access to them.

Attachment 2 is an illustrated summary of the essential features and many advantages unique to intelligent boosters.

Respectfully submitted,

Jeremy K. Raines, Ph.D., P.E.
Michael Millard

By: 

Michael Millard
265 S. Federal Hwy #324
Deerfield Beach, FL 33441

By: 

Jeremy K. Raines, Ph.D., P.E.
13420 Cleveland Drive
Rockville, MD 20850

Dated: October 11, 2011.
VIA: ECFS.

Attachment 1

Sample User Interface for Technician's Kill Switch Terminal

Discover Nearby Boosters

SB100047AE

SB100062BC

SB100102AA

3 Total Boosters in Range

Sort by Distance

Sort by Carrier

Sort by Spectrum

Carrier

Model #

Serial #

Software Release

Memory Serial #

Issue Date

Expiration Date

Memory Card Valid?

ABC Telecom

SB-800-1900

SB100062BC

1.0

E2647A1EB02

15-JUL-2011

30-NOV-2011

Yes

305 FEET

Subscriber Name

Contact Phone #

E-Mail

Smart Booster

561-962-2401

info@smartbooster.net

GPS Data (Booster)

GPS Status

Latitude

Longitude

Altitude (Feet)

Time (UTC)

Est. Position Error (Feet)

HDOP / VDOP

Satellites in View

Last Position Update

Locked

26.101724

-080.117099

14

2011-09-02T13:15:30Z

10

0

8

2011-09-02T13:14:00Z

Operational Status...

Device is...

Composite RF Power (Final Amplifier Stage)

Temperature (deg-F)

PA Current (mA)

POWERED ON

75% POWER

92.5

260

Spectrum - (Currently programmed, Red=Off, Green = On)

Cellular

PCS

A-BLOCK

B-BLOCK

A

B

C

D

E

F

C1

C2

C3

Turn Booster OFF

Turn Booster ON

Requires Confirmation

KILL SWITCH

Temporary Control of Selected Booster

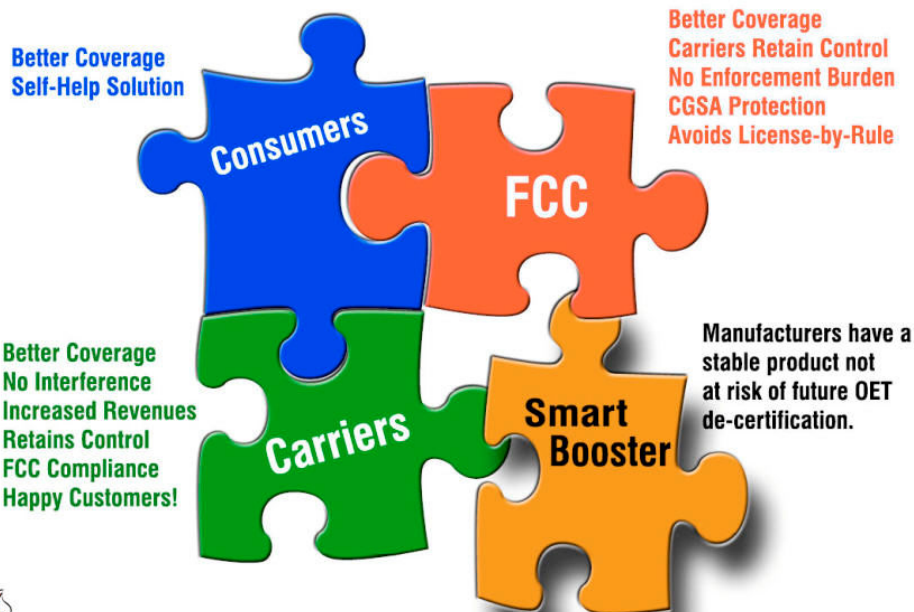
12

Attachment 2

Illustrated Summary of the Smart Booster

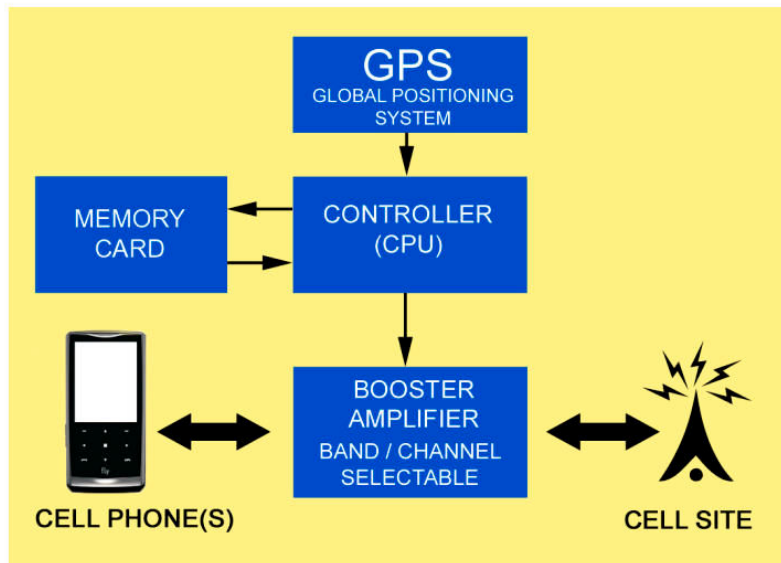


Smart Booster Satisfies Everyone!



Page 1

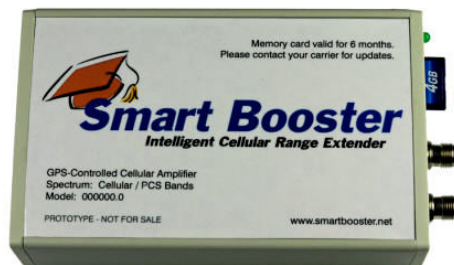
How the Smart Booster Works...



Patented Technology

Page 2

Memory Card Avoids License-by-Rule and Guarantees Carrier Control Under Existing Rules.


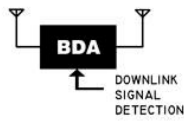



- Carrier-Specific Operation, Even in Mobile Environments.
- Power Output Determined by Latitude & Longitude.
- Memory Card Has an Expiration Date Beyond Which the Device Will Not Operate.
- Kill Switch Feature Provides Carriers with Secure, Remote Control Deactivation Capability.



Page 3

Only Smart Booster solves all the problems.

	BASIC BOOSTER	ADAPTIVE BOOSTER	Smart Booster Intelligent Cellular Range Extender
			
Maintains Carrier Operational Control	✗	✗	✓
Carrier-Specific Spectrum	✗	✗	✓
Operation Only Where Needed	✗	?	✓
Respects CGSA Boundaries	✗	✗	✓
Prevents Harmful Interference	✗	?	✓



Page 4

Only Smart Booster Complies with Existing Blanket Licensing Rules.

Devices Must be
Operable Under
Existing Carrier
Blanket Licensing



Devices Require
New FCC
Part-95
License-by-Rule

CARRIERS:		
ATT	✓	
BLOOSTON LICENSEES	✓	
CINCINNATI BELL	✓	
CTIA	✓	
SPRINT	✓	
TIA	✓	
T-MOBILE	✓	
US CELLULAR	✓	
VERIZON	✓	
WCAI	✓	
BOOSTER MANUFACTURERS:		
CELL ANTENNA CORP.		✗
CELL LYNX		✗
CELLPHONE MATE		✗
POWERFUL SIGNAL		✗
SMART BOOSTER	✓	
WILSON ELECTRONICS		✗
WIRELESS EXTENDERS		✗



Source: Ex Parte filings in FCC WT Docket 10-4.

Page 5

Millard / Raines Partnership

265 S. Federal Hwy #324
Deerfield Beach, FL 33441
www.smartbooster.net



Have Questions or Comments?

Frank Lee
Managing Partner
Direct: 239-246-5570

e-Mail: frank@smartbooster.net



[End of Illustrated Summary.]

FCC 2.803 Compliance Notice:

Prototype - Not for Sale

The Smart Booster device has not been authorized as required by the rules of the Federal Communications Commission. This device is not, and may not be, offered for sale or lease, or sold or leased, until authorization is obtained.

Intellectual Property Notice:

Smart Booster™ and the Smart Booster logo are trademarks of the Millard/Raines Partnership. The Smart Booster device is patent-pending in the United States under application US 12/319,242.

All other service marks, trademarks or registered trademarks appearing in this document belong to their respective owners.